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ABSTRACT

The purpose of this self-teaching guide is to assist educators in assessing their capability of thinking outside the box in solving problems. The content is based on training sessions and research papers presented at various conferences during the 1999-2000 academic year. "Thinking outside the box" (TOB) is defined as a problem-solving power that everyone possesses when thinking differently from conventional thought. Putting TOB into practice requires these three steps: (1) asking the right questions; (2) testing assumptions; and (3) making creative leaps. Following the body of the paper, section A contains a problem solving exercise with 10 riddles designed for 2 participants. One person should try to solve these riddles while a partner serves as coach. Section B contains 10 additional riddles, and the participants should trade roles so that both can practice problem solving and coaching. (SLD)

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THINKING OUTSIDE THE BOX: A SELF-TEACHING GUIDE FOR EDUCATIONAL LEADERS

By

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The purpose of this self-teaching guide is to assist educators in assessing their capability to think outside the box in solving problems. The content presented in the guide is based on training sessions and research papers presented by the authors at annual meetings of the American Association of Colleges for Teacher Education, Louisiana Educational Education Research Association, Mid-South Educational Research Association, and Southeastern Regional Association of Teacher Educators during the 1999-2000 academic year. The guide was developed specifically for distribution to interested educators through the auspices of the U.S. Department of Education's Educational Resources Information Center (ERIC). Content presented in the guide is divided into the following five sections:

Thinking Outside the Box
Section A: Solving Problems
Section A: Coaching the Problem Solver
Section B: Solving Problems
Section B: Coaching the Problem Solver

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THINKING OUTSIDE THE BOX

What is outside-the-box thinking? Thinking outside the box (TOB) is a problem-solving power which everyone possesses, thinking different from conventional thought. In conventional thinking we think along familiar lines, using experiences from similar situations and building on prior logical assumptions. Sometimes, however, it's necessary to move beyond core assumptions and approach a problem from a completely new perspective.

The ancient Greeks, for instance, built a magnificent civilization with splendid architecture based on up-right columns supporting beams on which higher floors and roofs were placed. They never built arches. Because the column and beam approach had limited strength, the size of the buildings and the open spaces therein were curtailed.

One day, according to tradition, some unknown stonemason developed the insight to use an arch of stones to carry a load. He shaped each stone like a wedge and slotted them together without mortar to form a shape that had greater intrinsic strength than the column and beam method. The invention of the arch changed architecture completely by allowing the creation of much larger buildings with open space and more light.

Later, the Romans used the arch to magnificent effect. The arch enabled the construction of huge, graceful aqueducts and buildings with beautiful domes. The unknown stonemason who had the foresight to design buildings with arches rather than columns and beams was an outside-the-box thinker.

The Arabic numbering system provides another TOB example. A major limitation for the Romans was their numbering system, a system in which 9 was represented by IX and 16 by XVI. As a counting system it worked, but it didn't worked for multiplication, factoring, fractions, or any kind of advanced numerical calculation. The Arabic system which replaced it was built on a completely different concept and

introduced a new idea--the inclusion of zero. The Roman numbering system did not incorporate zero in its higher numbers but the Arabs gave us a system which allowed 0, 10, 100, 1000, and so on. The arch and Arabic numbering system represent TOB--creating solutions whenever conventional problem-solving methods fail.

TOB provides educators an important means for solving problems that do not have easy answers. Putting the concept into practice requires three key steps: (1) asking the right questions, (2) testing assumptions, (3) making creative leaps.

Asking the Right Questions

Asking the right questions is the first step. Although it's important in facing any problem to ask questions before considering possible solutions, asking any questions will not do; we have to ask the right questions. In the TOB context, the term "right questions" means basic or fundamental questions.

The story of a famous but struggling pen-manufacturing company illustrates what it means to ask the right questions. Because the company was experiencing difficulty, the directors of the company focused their attention on one key question: "What can we do to increase sales of our pens?" They tried all sorts of specific answers, but sales continued to fall. Eventually they recruited a new marketing director. He surprised the directors by asking a different and more fundamental question. He asked, "What business are we really in?" He found that people bought the company's expensive pens as gifts for others rather than as pens for themselves. The answer to this question caused the company to change its pricing, packaging, and distribution strategies. Once the directors changed the organization's orientation from being a pen company to a gift company, sales increased.

At the beginning of any investigation, it's important to establish the broad framework and focus on details later. Establish the framework of the problem and then ask more specific questions to organize information. For example, If you were asked to

guess a number between I and 100, your initial question should not be: "Is it 37?" Your chance of selecting the right number is one in a hundred. A better question would be, "Is it less than 50?" If the answer to that question is "yes," then your next question could be: "Is it more than 25?" and so on. You can guess the number in seven questions if you use such a technique.

Unfortunately, many educational leaders use a "one out of a hundred" approach in solving problems. They try to guess a specific solution to the problem instead of asking broad questions that narrow the field of inquiry through "yes" or "no" answers.

Testing Assumptions

Testing assumptions is the second step in practicing TOB. Educators sometimes jump to wrong conclusions in approaching problems because they have a natural tendency to assume all sorts of things which may or may not apply. When we approach a problem carrying preconceived assumptions, we block out new possibilities.

For example, Marconi, the inventor of radio telegraphy, faced many doubters regarding radio transmission. In 1901 when he proposed sending radio signals across the Atlantic, the experts scoffed at the idea. They assumed if radio waves traveled in straight lines, the signals could not go around a curved surface like the earth. Marconi dramatically proved the doubters wrong when he tested his assumption and successfully transmitted a signal from England to Canada. The experts were unaware of an electrically charged band, the ionosphere, which reflected the radio beams back to the earth.

It's natural to assume that a new situation is similar to previously experienced situations. We often formulate an answer before checking out all the details surrounding a particular situation. Consequently, we jump to wrong conclusions because our assumptions are erroneous. Before selecting a solution to an important

problem, we should check out the assumptions on which we have based our assessment because sometimes the inherent ambiguities in a particular situation mislead us.

Making Creative Leaps

Making creative leaps constitutes the third step in putting TOB into action. To solve difficult problems, it's often necessary to do more than refine or improve current techniques. We have to make a creative leap to generate a new idea.

The Fosbury Flop is an example of introducing an entirely new concept to the event of high jumping in the sport of track and field. Until 1968, every high jumper rolled over the bar with his or her face down. In 1968, Dick Fosbury, an American, introduced an entirely new approach, leaping over with his back close to the bar and his face up. Although Fosbury was ranked 48th in the world in 1967, he caused a sensation in 1968 when he won the Olympic gold medal with his unprecedented technique. Fosbury's creative approach revolutionized high jumping. Today, nearly all the top high jumpers use his method.

Fosbury's approach to improving his high jumping performance represents the very essence of thinking beyond conventional limits. The crux of outside-the-box thinking is achieving a creative solution by moving towards the problem from a new direction rather than by trying to continue to refine old methods.

Creative leaps, however, must be scrutinized using common sense. Imaginative ideas need to be critically analyze with the cold precision of the surgeon's scalpel.

A hypothetical example of a creative thinker employing common sense would be an advertising executive who comes up with ingenious ideas to meet tough marketing challenges. Such an advertiser would not be impressed by the tried and true. She would not believe the conventional assumptions about her client's products but would test them using market research. Next, she would come up with imaginative

ideas for solving the client's problem. Finally, she would critically analyze her imaginative ideas to select the one most likely to succeed--the one that fits the template of common sense.

Practicing the TOB Approach

Now that asking the right questions, testing assumptions, and making creative leaps have been addressed, you are ready to assess your TOB capability. Sections A and B of this guide are intended to assist you to become an unconventional problem solver. To work the problems, which are presented as riddles, you will need to pair with a colleague.

One of the best ways to practice TOB is for one member of the pair to try solving the 10 riddles in Section A, while the other person serves as the coach (see Section A: Coaching the Problem Solver). After completing the 10 riddles in Section A, the roles are reversed. The coach for Section A becomes the problem solver for Section B, the former problem solver becomes the coach.

To start the process, read the directions provided in the first five paragraphs in Section A first. Then attend to the first riddle, The Blind Beggar. The coach reads the directions, explaining the scoring system in Section A: Coaching the Problem solver.

After you've tried your hand at solving the 10 riddles in Section A, take a few moments to discuss the experience with your partner. Ask one another: What did you learn from this experience? Then switch roles and try to solve the problems in Section B. After finishing this section, reflect once again on your experience.

Bibliography

The bibliographical material which follows is provided for readers of this guide who wish to delve further into the use of unconventional thinking to solve problems. Little has been published on the subject from a TOB perspective.

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SECTION A: SOLVING PROBLEMS

Solving the 10 problems presented in the form of riddles in Section A requires (1) a problem solver and (2) a coach. If the problem solver is you, then your role is to solve the riddles, while the other person coaches. The person serving as coach can only answer "yes," "no," or "irrelevant" to your questions (or ask you to restate the question if it is ambiguous or likely to mislead). You have 10 questions (or guesses) to come up with a solution to the problem that is acceptable to your coach. Ask questions before trying to guess the solution. There is a five minute time limit for each riddle.

Your score for a particular riddle is computed by subtracting the number of questions you asked or guesses made from the sum of 10. The maximum score for a riddle is 9 (10 minus one guess). If you cannot solve the riddle within 10 question (or guesses) limit, your score will be zero.

In solving the riddles, start by asking broad questions that eliminate whole areas of investigation. Do not simply gather facts. Once you have established a broad framework for your thinking, move to find out specific details. Carefully consider all your assumptions. Continually ask yourself why you are making these assumptions. Then use your imagination. Avoid conventional thinking. Come at the problem from different directions. Make creative leaps! Do not make guesses until you are confident than you're near the answer. Then ask yourself: Does the solution fit the standard of common sense?

The 10 problems, presented as riddles, for Section A follow. Informational notes accompany some of the riddles. Address the riddles in the order they are presented:

1. The Blind Beggar. A blind beggar had a brother who died. What relation was the blind beggar to the brother who died?

2. Too Much Money. You have exactly $101 in your pocket. You have just two bills and no change. One of the bills is not a dollar bill. What are denominations of the two bills?

3. The Secretary's Daughter: A woman went to visit the manager of her bank. She took her young daughter with her. The bank manager said the woman's

daughter could stay with his secretary during the meeting. When the woman and her daughter left, the manager's secretary turned to another secretary in the bank and said to her, "That little girl was my daughter." How could that be?

Please note: This riddle does not involve adoptions, step-parents, in-laws, or grandparents.

4. Charlie Tuna's Galley: Charlie Tuna's Galley is an excellent restaurant with a fine reputation. The restaurant is especially noted for its very fresh seafood. One stormy day, however, many of the people who had lunch there became sick in the late afternoon. An inspection showed there was nothing wrong with the food. What happened? Why did the people get sick?

   Please note: The people eating lunch were normal, healthy people. It was not something they saw that made them sick.

5. John's Shoes: Due to an inheritance from one his aunts, John, a college student, was able to hike throughout North America one summer traveling from site to site by airplane . However, every time John came to an airport he took off his shoes. Why did John take off his shoes?

   Please note: John was a normal college student. He had no criminal tendencies or physical disabilities. John only took his shoes off for a few minutes only and then put them on again.

6. The Climbing Bear: Bears often climb telephone poles located in wilderness areas. Why do they do this?

   Please note: Bears who climb telephone poles do not do so out of fear but for a very deliberate reason. Sometimes bears make a wrong assumption because they hear something that is not true.

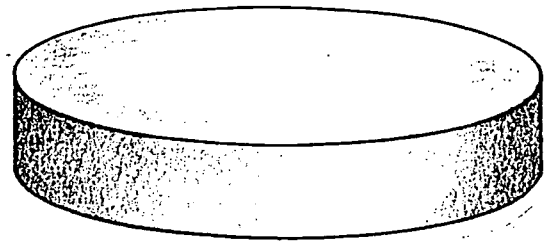
7. The Parking Ticket: Ed lived in Boston and parked his car for three hours on a busy street where no parking was allowed. A traffic officer visited the street every hour and carefully gave a parking ticket to every car parked there. Although there was a ticket on Ed's car when he returned, he threw it away and never paid it. What is more, the authorities were unable to penalize and fine Ed for this, despite the fact that it was his car and it displayed the correct registration. How did Ed get away with parking illegally?

   Please note: What Ed did was illegal. When he arrived, there were cars already there. He knew that a traffic officer would visit the street and see his car parked illegally. He did not have a doctor's sign, disabled sign, or any kind of dispensation. The traffic officer made sure that every car parked illegally, including Ed's car, had a ticket on the its windshield.

8. The Big Buy. A woman went to the store and bought some plates at $5 each, some spoons at $1 each, and some beads at 5 cents each. She bought 100 items in total and spent exactly $100. On her way home she dropped a bead. How many of each--plates, spoons and beads--did she buy?

   Please note: The woman definitely bought at least one bead. The number of beads she bought must be a multiple of 20; otherwise the total bill would not amount to an even number of dollars. So, she must have gotten either 20, 40, 60, or 80 beads.

9. Cutting the Cake. How could you cut a plain circular cake into eight equal portions with just three straight cuts of a knife?



Please note: The first two cuts are obvious, but the third cut is less obvious and very different from the first two.

10. The Lost Jewelry: A couple went on vacation for three weeks. They carefully locked their house before they left. The wife hid her jewelry in place nobody would have expected. When the couple returned, the wife was distressed to learn that there had been a prolonged power failure and she had lost all her jewelry even though there was no evidence of burglary. How did this happen?

Please note: The woman's jewelry was lost by accident after she had hidden the jewelry in what she thought was a very safe place.

After you have finished trying to solve the 10 problems, ask the coach for each of your scores. Record the score you made for each of the problems.

	Score
1. The Blind Beggar	_____
2. Two Much Money	_____
3. The Secretary's Daughter	_____
4. Charlie Tuna's Galley	_____
5. John's Shoes	_____
6. The Climbing Bear	_____
7. The Parking Ticket	_____
8. The Big Buy	_____
9. Cutting the Cake	_____
10. The Lost Jewelry	_____

Add up your scores for the 10 problems and record the total on the following line _____. Then assess yourself according to the following criteria:

Over 75 points--an excellent score: You are a first-rate questioner who can ferret out the truth with a minimum of questions even in difficult situations. You have a creative mind that is versatile and imaginative. You appear able to check your assumptions, discard the false ones, and exercise common sense. In brief, you are a very good outside-the-box thinker.

From 61 to 75 points---a very good score: Your questioning technique is good and with more practice you will learn to focus even better on the key issues. You are probably more imaginative than the average person and your questioning technique allows you to accurately follow up new ideas. Occasionally, however, you may have a tendency to cling to initial assumptions too long.

From 40 to 60 points--an average score: If you solved the riddles but used too many questions, you need to practice your questioning technique. Concentrate on establishing the basics first, and then reduce your field of questioning to focus on the most promising line of inquiry. If you failed to solve the riddles despite lengthy questioning, then you probably need to be more imaginative. Preconceived notions may sometimes prevent you from seeing new solutions. Try to be more open, adaptable, and receptive to new ideas. Come up with as many ideas as you can and then exercise common sense in choosing the most appropriate one.

Less than 40 points--a below average score: You definitely need to improve your questioning technique. Go over the problems that you found difficult and analyze what it was that blocked your progress. Did you have difficulty thinking of appropriate questions? Did you fail to solve the problems despite careful questioning? Be prepared to question everything that you may take for granted in confronting a new problem. Maybe you're too inhibited in your thinking and need to be more imaginative. Practice brain-storming, word association, and similar exercises to build your creativity.

Now that you have tested your TOB capability, go back to some of the riddles that gave you difficulty. Try to think of sorts of questions that would have helped you solve them. It is much easier to think of the right questions once you know the solution. This procedure can help you to develop your questioning technique for other problems. The more educated we are, the more we suffer from the mental restrictions of too many logical assumptions. Riddles work because they contain ambiguities. We normally find solutions based on simple misunderstandings of ambiguities. Once we travel that route, it's difficult to solve a problem such as the blind beggar riddle.

Most people struggle with a riddle because they are misled by an ambiguity in the wording. Ambiguities occur not just in riddles but also in real-life situations. It's easy to misinterpret ambiguous statements and jump to wrong conclusions based on erroneous assumptions. Before selecting a solution to a problem, we should check out the assumptions on which we have based our assessment because sometimes inherent ambiguities in a particular situation mislead us.

SECTION A: COACHING THE PROBLEM SOLVER

The goal of the coach is to help the outside-the-box thinker produce an acceptable answer to each of the riddles with the least number of questions or guesses. As a coach, you can only answer "yes," "no," or "irrelevant" to the person's questions (or ask the person to restate the question if it is ambiguous or likely to mislead). There is a five minute time limit for each riddle. Mark an X on the line opposite the number of the question asked or guess made.

To be correct, the outside-the-box thinker must come up with the solution to the problem given as the official answer or provide an answer that is acceptable to the coach because it solves the problem. The score for a particular riddle is computed by subtracting the number of questions asked or guesses made from the sum of 10. The best possible score for a riddle is 9 (10 minus the one guess which is the answer). If the riddle is not solved within 10 questions (or guesses), the person's score is zero.

The 10 problems (presented in the form of riddles) in Section A, scoring systems, and answers follow:

1. The Blind Beggar. A blind beggar had a brother who died. What relation was the blind beggar to the brother who died?

   1. Question/guess _____
   2. Question/guess _____
   3. Question/guess _____
   4. Question/guess _____
   5. Question/guess _____
   6. Question/guess _____
   7. Question/guess _____
   8. Question/guess _____
   9. Question/guess _____
   10. Question/guess _____ Total score _____

   Answer: The blind beggar was the sister of her brother who died.

2. Too Much Money. You have exactly $101 in your pocket. You have just two bills and no change. One of the bills is not a dollar bill. What are denominations of the two bills?

   1. Question/guess _____
   2. Question/guess _____

3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: One of the notes is not a dollar bill. It's a $100 bill! One bill is a dollar bill and the other is a $100 bill.

3. The Secretary's Daughter: A woman went to visit the manager of her bank. She took her young daughter with her. The bank manager said the woman's daughter could stay with his secretary during the meeting. When the woman and her daughter left, the manager's secretary turned to another secretary in the bank and said to her, "That little girl was my daughter." How could that be?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The secretary was the girl's father.

4. Charlie Tuna's Galley: Charlie Tuna's Galley is an excellent restaurant with a fine reputation. The restaurant is especially noted for its very fresh seafood. One stormy day, however, many of the people who had lunch there became sick in the late afternoon. An inspection showed there was nothing wrong with the food. What happened? Why did the people get sick?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: Charlie Tuna's restaurant is on board a cruise ship.

5. John's Shoes: Due to an inheritance from one his aunts, John, a college student, was able to hike throughout North America one summer traveling from site to site by airplane . However, every time John came to an airport he took off his shoes. Why did John take off his shoes?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: John was wearing hiking boots with steel buckles. He removed them every time he came to a security-check metal detector so as not to set it off.

6. The Climbing Bear: Bears often climb telephone poles located in wilderness areas. Why do they do this?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The bear hears the wires humming and mistakes this for bees humming. It climbs the telephone pole in search of honey in the beehive.

7. The Parking Ticket: Ed lived in Boston and parked his car for three hours on a busy street where no parking was allowed. A traffic officer visited the street every hour and carefully gave a parking ticket to every car parked there. Although there was a ticket on Ed's car when he returned, he threw it away and never paid it. What is more, the authorities were unable to penalize and fine Ed for this, despite the fact that it was his car and it displayed the correct registration. How did Ed get away with parking illegally?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____

4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: When Ed parked his car, there were some other illegally parked cars in the street. He simply took a ticket from one of their windshields and stuck it on his own. This is, of course, completely illegal, but it did mean that no ticket was ever written for his car.

8. The Big Buy. A woman went to the store and bought some plates at $5 each, some spoons at $1 each, and some beads at 5 cents each. She bought 100 items in total and spent exactly $100. On her way home she dropped a bead. How many of each--plates, spoons and beads--did she buy?

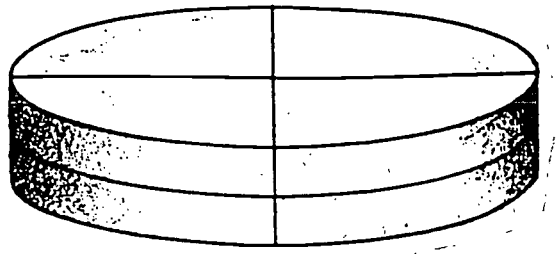
1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: She bought 19 plates, I spoon, and 80 beads.

9. Cutting the Cake. How could you cut a plain circular cake into eight equal portions with just three straight cuts of a knife?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: With the first two cuts you divide the cake from the top into quarters. You then take the knife and slice (laterally) through the middle of the side of the cake.



10. The Lost Jewelry: A couple went on vacation for three weeks. They carefully locked their house before they left. The wife hid her jewelry in place nobody would have expected. When the couple returned, the wife was distressed to learn that there had been a prolonged power failure and she had lost all her jewelry even though there was no evidence of burglary. How did this happen?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The wife had hidden her best jewelry inside her freezer in a bag among all the frozen food. Because of a general power failure the freezer had gone off and the food spoiled. A friendly neighbor (who had a key in order to water the plants) had tried to be helpful. She threw out all the food that went bad in the freezer. The jewelry got thrown out with the soiled food.

After completing your coaching stint, provide the problem solver with the scores. The problem solver should record the score made for each of the problems. Encourage the problem solver to review some of the riddles that were difficult to solve.

SECTION B: SOLVING PROBLEMS

Solving the 10 problems presented in the form of riddles in Section A requires (1) a problem solver and (2) a coach. If the problem solver is you, then your role is to solve the riddles, while the other person coaches. The person serving as coach can only answer "yes," "no," or "irrelevant" to your questions (or ask you to restate the question if it is ambiguous or likely to mislead). You have 10 questions (or guesses) to come up with a solution to the problem that is acceptable to your coach. Ask questions before trying to guess the solution. There is a five minute time limit for each riddle.

Your score for a particular riddle is computed by subtracting the number of questions you asked or guesses made from the sum of 10. The maximum score for a riddle is 9 (10 minus one guess). If you cannot solve the riddle within 10 question (or guesses) limit, your score will be zero.

In solving the riddles, start by asking broad questions that eliminate whole areas of investigation. Do not simply gather facts. Once you have established a broad framework for your thinking, move to find out specific details. Carefully consider all your assumptions. Continually ask yourself why you are making these assumptions. Then use your imagination. Avoid conventional thinking. Come at the problem from different directions. Make creative leaps! Do not make guesses until you are confident than you're near the answer. Then ask yourself: Does the solution fit the standard of common sense?

The 10 problems, presented as riddles, for Section B follow. Informational notes accompany some of the riddles. Address the riddles in the order they are presented:

1. <u>The Barber Paradox.</u> During the 1800s, a small western town had a strange law that all men must be clean-shaven and that no man could shave himself. The only person allowed to shave people was the licensed town barber (who was forty years old). There was only one barber. Since the barber was bound by the same law, who shaved the barber?

   Please note: The barber did not break the law. There was no beard, mustache, or whiskers on the barber's face, yet that face was not shaved by the barber.

2. Late Arrival. A father said to his teenage daughter, "Once you arrived very late, at 3 o'clock in the morning, and you kept me and your mother waiting anxiously for you. I do not want that to ever happen again." The girl replied, "That was true once, Father, but I will never be able to do that again." What did the girl mean?

   Please note: The father was not angry. He was teasing his daughter. The girl could not arrive the same way again because what she did could only be done once. The statements the father made did not refer to the previous night or any recent night.

3. Wanting to See a Movie. The man had never seen the movie "Top Gun" before he got on the morning flight to take him from New York to Los Angeles with only one stop in Dallas, Texas. He had heard the movie was good and was pleased to see that "Top Gun" was the movie shown during the flight. After lunch, the man did not bother to watch the screening of the movie even though he had a clear view of the screen and the sound and picture quality were fine. Why didn't he want to see the movie after lunch?

   Please note: The man wanted to watch the movie when he got on the plane but not when it was shown after lunch. Nobody had ruined the movie for him by telling him the plot. He had nothing particularly interesting to do after lunch.

4. No Compensation: The tallest building in a famous city is 62 stories high and covered in glass panels. The proud owner of the building, an insurance company, was horrified when glass panels started to fall from the building, causing danger and damage in the surrounding area. The problem occurred because the glass manufacturer had been negligent in supplying glass which was not properly made, as specified in the building's design. The company that owned the building instituted a lawsuit against the glass company claiming millions of dollars worth of damages. They had an excellent case and would have won the suit, but one week before it was due to start they dropped all claims against the glass company and received no compensation whatsoever. Why did they drop the suit?

   Please note: The company that owned the building would have won the lawsuit but would have been worse off having won it. This was not because the legal fees would have been higher than the damages. They could expect damages of $50 million and legal fees of $5 million. The company that owned the building did not own any part of the glass company. There were no ties because of people or families between the two companies.

5. The Tenth Floor: A well-respected Japanese insurance company has many offices around the world. In leasing space, the company insists that all its offices are located on the tenth floor or higher. Why does the company do this?

   Please note: The company's policy for leasing office space has nothing to do with its philosophy, products, name, or advertising.

6. Satisfied: A man received an envelope. Inside, there was another envelope which contained a letter. The letter said, "Here is the $20,000 I promised you. Best regards, Dad." There was no check, cash, precious coins, stocks, bonds,

or jewels inside the envelope, but the man who received its contents was perfectly satisfied. Why?

Please note: There was no secret or coded information passed in the letter or envelope. There was an outer envelope, an inner envelope, and a letter. Yet the man had received something worth $20,000. The outer envelope was new and had the man's address on it. The inner envelope was old and had someone else's address on it. The address on the inner envelope was not of someone known to either the father or his son.

7. Four Quarts of Water. A woman went down to the river with two empty water containers, one of 3-quart capacity and one of 5-quart capacity. Using just these two containers, the woman brought back exactly four quarts of water? How did she do it?

   Please note: Use scratch paper to sketch possibilities.

8. The Jump: A woman hurriedly jumped into a swimming pool and shrieked. Why did she shriek?

   Please note: It was a regular swimming pool containing water. Other people were swimming safely in the pool. The woman was a good swimmer and was in no physical danger. She realized something as soon as she jumped in. She was in perfect health and suffered no injury jumping into the pool.

9. Budget Stretching. A geographic explorer wishes to cross a desolate desert on foot in order to do some mapping. The crossing will take six days, but any one man can take enough food and water for four days. Fortunately, the local native village can supply him with men who will act as bearers, but they charge $100 per day for their work. Unfortunately, the explorer has a very limited budget. What is the least number of bearers he needs to help him make the journey and what will it cost him in wages?

   Please note: One man can carry four days' supplies. If the one bearer stops after one day and turns back, he can pass on two days of supplies to two other men, leaving one day of supplies for his return.

10. Morning Biscuits: The Danish government issues some of the staff in one of its major departments free biscuits every morning. Why are the biscuits issued?

    Please note: The biscuits are not for the staff's own consumption. They give the biscuits away for their own protection.

After you have finished trying to solve the 10 problems, ask the coach for each of your scores. Record the score you made for each of the problems.

	Score
1. The Barber Paradox	_____
2. Late Arrival	_____
3. Wanting to See a Movie	_____
4. No Compensation	_____

5. The Tenth Floor _____
6. Satisfied _____
7. Four Quarts of Water _____
8. The Jump _____
9. Budget Stretching _____
10. Morning Biscuits _____

Add up your scores for the 10 problems and record the total on the following line _____. Then assess yourself according to the following criteria:

Over 75 points--an excellent score: You are a first-rate questioner who can ferret out the truth with a minimum of questions even in difficult situations. You have a creative mind that is versatile and imaginative. You appear able to check your assumptions, discard the false ones, and exercise common sense. In brief, you are a very good outside-the-box thinker.

From 61 to 75 points---a very good score: Your questioning technique is good and with more practice you will learn to focus even better on the key issues. You are probably more imaginative than the average person and your questioning technique allows you to accurately follow up new ideas. Occasionally, however, you may have a tendency to cling to initial assumptions too long.

From 40 to 60 points--an average score: If you solved the riddles but used too many questions, you need to practice your questioning technique. Concentrate on establishing the basics first, and then reduce your field of questioning to focus on the most promising line of inquiry. If you failed to solve the riddles despite lengthy questioning, then you probably need to be more imaginative. Preconceived notions may sometimes prevent you from seeing new solutions. Try to be more open, adaptable, and receptive to new ideas. Come up with as many ideas as you can and then exercise common sense in choosing the most appropriate one.

Less than 40 points--a below average score: You definitely need to improve your questioning technique. Go over the problems that you found difficult and analyze what it was that blocked your progress. Did you have difficulty thinking of appropriate questions? Did you fail to solve the problems despite careful questioning? Be prepared to question everything that you may take for granted in confronting a new problem. Maybe you're too inhibited in your thinking and need to be more imaginative. Practice brain-storming, word association, and similar exercises to build your creativity.

Now that you have tested your TOB capability, go back to some of the riddles that gave you difficulty. Try to think of sorts of questions that would have helped you solve them. It is much easier to think of the right questions once you know the solution.

This procedure can help you to develop your questioning technique for other problems. The more educated we are, the more we suffer from the mental restrictions of too many logical assumptions. Riddles work because they contain ambiguities. We normally find solutions based on simple misunderstandings of ambiguities. Once we travel that route, it's difficult to solve a problem such as the blind beggar riddle.

Most people struggle with a riddle because they are misled by an ambiguity in the wording. Ambiguities occur not just in riddles but also in real-life situations. It's easy to misinterpret ambiguous statements and jump to wrong conclusions based on erroneous assumptions. Before selecting a solution to a problem, we should check out the assumptions on which we have based our assessment because sometimes inherent ambiguities in a particular situation mislead us.

SECTION B: COACHING THE PROBLEM SOLVER

The goal of the coach is to help the outside-the-box thinker produce an acceptable answer to each of the riddles with the least number of questions or guesses. As a coach, you can only answer "yes," "no," or "irrelevant" to the person's questions (or ask the person to restate the question if it is ambiguous or likely to mislead). There is a five minute time limit for each riddle. Mark an X on the line opposite the number of the question asked or guess made.

To be correct, the outside-the-box thinker must come up with the solution to the problem given as the official answer or provide an answer that is acceptable to the coach because it solves the problem. The score for a particular riddle is computed by subtracting the number of questions asked or guesses made from the sum of 10. The best possible score for a riddle is 9 (10 minus the one guess which is the answer). If the riddle is not solved within 10 questions (or guesses), the person's score is zero.

The 10 problems (presented in the form of riddles) in Section B, scoring systems, and answers follow:

1. The Barber Paradox. During the 1800s, a small western town had a strange law that all men must be clean-shaven and that no man could shave himself. The only person allowed to shave people was the licensed town barber (who was forty years old). There was only one barber. Since the barber was bound by the same law, who shaved the barber?

   1. Question/guess _____
   2. Question/guess _____
   3. Question/guess _____
   4. Question/guess _____
   5. Question/guess _____
   6. Question/guess _____
   7. Question/guess _____
   8. Question/guess _____
   9. Question/guess _____
   10. Question/guess _____ Total score _____

   Answer: The licensed town barber was a woman! She didn't need to shave.

2. Late Arrival. A father said to his teenage daughter, "Once you arrived very late, at 3 o'clock in the morning, and you kept me and your mother waiting anxiously for you. I do not want that to ever happen again." The girl replied,

"That was true once, Father, but I will never be able to do that again." What did the girl mean?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The father was talking about the girl's birth. The daughter's answer that "I will never be able to do that again" meant she could never be born again.

3. Wanting to See a Movie. The man had never seen the movie "Top Gun" before he got on the morning flight to take him from New York to Los Angeles with only one stop in Dallas, Texas. He had heard the movie was good and was pleased to see that "Top Gun" was the movie shown during the flight. After lunch, the man did not bother to watch the screening of the movie even though he had a clear view of the screen and the sound and picture quality were fine. Why didn't he want to see the movie after lunch?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The movie was shown twice on the flight, once before lunch and once after lunch. He watched it the first time and was not interested in seeing it again so soon.

4. No Compensation: The tallest building in a famous city is 62 stories high and covered in glass panels. The proud owner of the building, an insurance company, was horrified when glass panels started to fall from the building, causing danger and damage in the surrounding area. The problem occurred because the glass manufacturer had been negligent in supplying glass which was not properly made, as specified in the building's design. The company that owned the building instituted a lawsuit against the glass company

claiming millions of dollars worth of damages. They had an excellent case and would have won the suit, but one week before it was due to start they dropped all claims against the glass company and received no compensation whatsoever. Why did they drop the suit?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The company that owned the building was an insurance underwriting group who owned a number of specialty insurance companies who sold a variety of policies. They discovered late in the proceedings that one of their subsidiary companies carried the insurance coverage for the glass company's liability. So if they had won the suit, they would have had to bear the ultimate cost of compensating themselves!

5. The Tenth Floor: A well-respected Japanese insurance company has many offices around the world. In leasing space, the company insists that all its offices are located on the tenth floor or higher. Why does the company do this?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The Japanese insurance company believes strongly in physical fitness and that going up and down stairs keeps its employees healthier and more alert. No employee is allowed to use the elevator, or lift, unless she or he has a medical condition prohibiting them from climbing stairs.

6. Satisfied: A man received an envelope. Inside, there was another envelope which contained a letter. The letter said, "Here is the $20,000 I promised you. Best regards, Dad." There was no check, cash, precious coins, stocks, bonds, or jewels inside the envelope, but the man who received its contents was perfectly satisfied. Why?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The man and his father were stamp collectors. The inner envelope had a rare stamp on it worth $20,000.

7. Four Quarts of Water. A woman went down to the river with two empty water containers, one of 3-quart capacity and one of 5-quart capacity. Using just these two containers, the woman brought back exactly four quart of waters? How did she do it?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: There are two likely answers.

One answer is she filled the 3- quart container from the 5-quart container, leaving two quarts in the 5- quart container. She then emptied the 3-quart container and poured the two quarts from the 5-quart container into the 3-quart container. She then refilled the 5-quart container and from it she filled the 3-quart container, leaving exactly four quarts in the 5-quart container

Another answer is she filled the 3-quart container and then poured it into the 5-quart container. She refilled the 3-quart container and from it filled the 5-quart container, leaving one quart in the 3-quart container. She emptied the 5-quart container and then poured one quart from the 3-quart container into the 5-quart container. She refilled the 3-quart container and poured it into the 5-quart container, making four quarts exactly in the 5 quart container.

8. The Jump: A woman hurriedly jumped into a swimming pool and shrieked. Why did she shriek?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: She realized that she was still wearing the new watch which her husband had given her as a present and it was not waterproof.

9. Budget Stretching. A geographic explorer wishes to cross a desolate desert on foot in order to do some mapping. The crossing will take six days, but any one man can take enough food and water for four days. Fortunately, the local native village can supply him with men who will act as bearers, but they charge $100 per day for their work. Unfortunately, the explorer has a very limited budget. What is the least number of bearers he needs to help him make the journey and what will it cost him in wages?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____
5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The explorer needs only two bearers and the journey costs him $600. The first goes with him for only one day and then returns, having handed over one day supplies to each of the other two men. The second bearer carries on a second day and then hands one day supply to the explorer before returning. The explorer then has four days of supplies for the remaining four days of the journey. The first man gets two days' wages and the second gets four, so it costs the explorer $600.

10. Morning Biscuits: The Danish government issues some of the staff in one of its major departments free biscuits every morning. Why are the biscuits issued?

1. Question/guess _____
2. Question/guess _____
3. Question/guess _____
4. Question/guess _____

5. Question/guess _____
6. Question/guess _____
7. Question/guess _____
8. Question/guess _____
9. Question/guess _____
10. Question/guess _____ Total score _____

Answer: The major governmental department provides postal service. The Danish government issues dog biscuits to all its postal delivery people every morning so they can use them to distract hostile dogs.

After completing your coaching stint, provide the problem solver with the scores. The problem solver should record the score made for each of the problems. Encourage the problem solver to review some of the riddles that were difficult to solve.

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